

The Influence of Physical and Mental Workload and Energy Intake on Nurse Work Fatigue in the Inpatient Room of the Dr. Pirngadi Regional General Hospital

Sarah Adinda[1], Gerry Silaban[2], Nurmaini[3]
[123]Faculty of Public Health, Universitas Sumatera Utara

Email correspondence: sarahadinda2109@gmail.com

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Abstract

Fatigue is a mechanism in which the body has to warn that something is disturbing the body, and it can recover after resting. Fatigue is one of the factors causing work accidents which causes as many as 2 million workers to die each year, and as many as 18,828 people (32.8%) out of 58,115 samples experience fatigue at work. The purpose of this study was to analyze the effect of physical and mental workload as well as energy intake on the work fatigue of nurses in the inpatient room of Dr. Pirngadi Regional General Hospital. This quantitative study uses a cross-sectional design using a proportional random sampling technique. The sample in this study was the nurse in the Inpatient Room at Dr. Pirngadi Regional General Hospital, namely as many as 63 nurses. Work fatigue was measured using a reaction timer, the physical workload was measured using pulse calculations, the mental workload was measured using the NASA-TLX questionnaire, and energy intake was measured using the estimated food record questionnaire. The data analysis used was univariate, bivariate with the Pearson Correlation test and multivariate with the Multiple Linear Regression test. The results of the Pearson Correlation test analysis showed that there was a significant influence between physical workload on work fatigue ($p = 0.001$, $r = 0.424$), mental workload on work fatigue ($p = 0.002$, $r = 0.385$), and energy intake on work fatigue ($p = 0.0005$, $r = -0.477$). At the same time, the results of the Multiple Linear Regression test analysis showed that the R Square value was 0.412 or 41.2%. Thus it can be concluded that 41.2% of the causes of work fatigue can be explained through the variables of physical workload, mental workload and energy intake in nurses in the Inpatient Room of Dr. Pirngadi Regional General Hospital.

Keywords:* *Energy Intake, Fatigue, Inpatient Room

INTRODUCTION

Fatigue is a factor in the occurrence of work accidents which causes as many as 2 million workers to die each year, and as many as 18.828 people (32.8%) from 58.115 samples experience fatigue at work (ILO, 2018). According to Kleiber and Ensman, publications on worker fatigue in Europe show that 32% experienced by health workers (especially nurses) in the first rank easily experience work fatigue, as much as 43% compared to doctors and pharmacists (Saparwati et al., 2020).

The results of a survey conducted by Kronos Incorporated of 257 nurses working in a United States Hospital stated that 98% of nurses said the work carried out was physically and mentally demanding, 85% noted that nursing work made them tired overall, and 41% of nurses had considered moving the hospital during the last year because of fatigue from work (Shah et al., 2021). This is not much compared to a survey conducted by the Registered Nurses Association of Ontario Canada in 2017, which stated that 50% of nurses indicated they missed

shifts due to fatigue, 80% felt tired after working most of the time, and 25.6% of nurses considered leaving. Work due to fatigue (MacLeod et al., 2017).

Research Bi et al., (2021) to 1.299 nurses in several Hospitals in Northeast China, of which 1.268 (97.6%) were female nurses. It was found that more than half (55.4%) of nurses were at a high level of work fatigue. This is because nurses have high work demands. According to the Health Sciences Consortium in 1989 in Karam et al., (2021), nurses have a role as nursing caregivers, advocates, educators, coordinators, collaborators, consultants, managers, and developers of nursing knowledge. These work demands can cause health problems for nurses, including work fatigue. Fatigue is a mechanism that the body has to give a warning that something is bothering the body, and it can recover after resting (Tarwaka, 2019).

The high work demands of nurses result in increased work activities. According to Suma'mur (2014), the work activity illustrates an increase in the workload of the work performed, especially the physical workload. The physical workload requires the work of the muscles, heart and lungs, so if the physical workload is high, the work of the muscles, heart and lungs will also be higher. Based on research conducted by Linni et al., (2018) shows that the physical workload experienced by nurses in the Inpatient Installation Room of GMIM Pancaran Kasih Manado General Hospital is in the heavy category of as many as 23 respondents (56.1%), and in the light category as many as 18 respondents (43.9%).

Excessive workload will result in physical and psychological fatigue and emotional reactions, such as headaches, indigestion and irritability. Whereas the workload is too little where the work is done because of repetitive motion, which causes boredom (Michael et al., 2022).

Many research results show that the prevalence of mental workload among nurses is high. According to a report from the Bureau of Labor Statistics, mental workload is the cause of work accidents that occur in the nursing profession in the United States, around 8.7% for every 100 nurses per year. Meanwhile, the Sidney University of Technology study on Australian nurses in 2018 showed that mental workload in terms of depression, anxiety and stress had percentages of 32.4%, 41.2% and 41.2% of fatigue (Maharaj et al., 2019). Then, according to research results, Widiastuti et al., (2017) show that the mental workload of nurses based on work shifts is 69.7% in the morning shift, 76.7% in the afternoon shift is included in the medium mental workload category, and 83% in the night shift is included in the high mental workload category.

In the inpatient room of the regional general hospital Dr. Pirngadi Medan has 3 shifts in effect, namely the morning shift at 08.00-15.00 WIB, the afternoon shift at 15.00-21.00 WIB, and the night shift at 21.00-08.00 WIB. Shift work is enforced with a rotation pattern. Each head nurse in the inpatient room of the Dr. Pirngadi Medan determines changes in the shift rotation pattern. One of the shift rotation patterns used is 2 days of the morning shift, 2 days of the afternoon shift, and 2 days of night shift, after 6 working days nurses are given 1 day off. The number of nurses on duty in each room each shift also varies according to the number of patients handled. One division of the number of nurses on duty is 5 nurses on duty in the morning shift, while the afternoon shift has 3 nurses on duty, and the night shift has 3 nurses on duty.

Based on Bed Occupancy Rate data or bed usage rates at the Dr. Pirngadi Regional General Hospital, which changes every year. The Bed Occupancy Rate in 2018 was 39.29%, in 2019 it was 28.16%, in 2020 it was 18.66% this year it has decreased due to the Covid-19 pandemic, then it increased in 2021 by 21, 98%, then increased in 2022 in January of 21.36%, in February of 24.33%, in March of 22.32%, in April of 23.76%, in May of 25.56%, in June 32.21%, July 31.87%, and August 30.96%.

Based on the initial survey conducted in measuring physical workload by calculating the pulse rate of nurses while working, it is in the mild to severe category. Light category workloads such as making regular reports on patient progress and evaluating according to patient problems, and handing over responsibilities to the next shift nurse. Moderate categories include placing IV, giving medicines, installing oxygen, and carrying out medical programs. Then heavy categories include pushing patient stretchers, lifting patients, pushing action equipment, tidying patient beds, helping patients to the toilet, and providing therapy.

Based on a survey of individual food consumption using the estimated food record method, it was found that 15 nurses had energy intake that matched the Nutrition Adequacy Rate and 10 nurses had energy intake that did not match the Nutrition Adequacy Rate. This is because there are still many nurses who skip meals before starting their work and still need to pay more attention to the nutritional value of the food they consume.

Based on the background of the problems above, the problem formulation of this study is "Is there an effect of physical and mental workload and energy intake on work fatigue of nurses in the inpatient room of the Dr. Pirngadi Regional General Hospital.

METHODS

This type of research is quantitative analytic research with a cross-sectional research design. This research was conducted at the Dr. Pirngadi Regional General Hospital. The research was conducted from March 2022 to April 2023. The population in this study were all nurses working at the Dr. Pirngadi Regional General Hospital. The sampling technique used in this study was a proportional random sampling technique. The number of samples in this study amounted to 63 nurses.

The independent variables in this study are physical workload, mental workload, and energy intake. While the dependent variable) in this study is work fatigue. Primary data was obtained by interviewing, using a questionnaire and measuring the nurses. Data on physical workload is obtained by measuring the working pulse. Physical workload data was obtained through the NASA Task Load Index (NASA-TLX) questionnaire. Energy intake data were obtained through a consumption survey using the estimated food record questionnaire. And secondary data in the form of an overview of the Dr. Pirngadi Regional General Hospital, the number of nurses, and the number of Bed Occupancy Rates (BOR) or bed usage.

Data analysis was carried out by statistical tests using the Pearson Correlation test and multiple linear regression tests to see the positive influence of physical workload, mental workload and energy intake on nurse fatigue.

RESULTS

Effect of physical workload, mental workload, and energy intake on work fatigue of nurses in the Dr. Pirngadi Regional General Hospital. The test results using the Pearson Correlation test can be seen in Table 1 below:

Table 1. Pearson Correlation Test between physical workload, mental workload and energy intake on Work Fatigue in Inpatient Nurses at Dr. Pirngadi Medan

Variable	Work Fatigue								r	P *value*
	Normal		Light		Moderate		Total			
	n	%	n	%	n	%	n	%		
Physical Workload										
Light	0	0	26	100	0	0	26	100	0,424	0,001
Moderate	1	2,7	11	29,7	25	67,6	37	100		
Total	1	1,6	37	58,7	25	39,6	63	100		
Mental Workload										
Very Hight	0	0	11	84,6	2	15,4	13	100		
Hight	1	2	40	80	9	18	50	100	0,385	0,002
Total	1	1,6	51	81	11	17,5	63	100		
Energy Intake										
Infufficient	0	0	2	20	8	80	10	100		
Normal	1	1,9	43	81,1	9	17	53	100	-0,477	0,0005
Total	1	1,6	45	71,4	17	26,9	63	100		

Based on Table 1. above, it can be seen that in the light category of physical workload as many as 0 nurses experienced work fatigue in the normal category, 26 nurses (100%) experienced work fatigue in the mild category and as many as 0 nurses experienced work

fatigue in the moderate category. Meanwhile, in the moderate category of physical workload, 1 nurse (2.7%) experienced work fatigue in the normal category, 11 nurses (29.7%) experienced work fatigue in the mild category, and 25 nurses (67.6%) experienced work fatigue in the moderate category.

The results of the Pearson correlation test between physical workload and work fatigue showed a value of p = 0.001 (p <0.05) so Ho was rejected so that there was an influence between physical workload and work fatigue in Inpatient Nurses Dr. Pirngadi Regional General Hospital. Meanwhile, the value of the correlation coefficient (r) is 0.424, which means the strength of the relationship (correlation) between the variables of physical workload and work fatigue is 0.424 or a moderate correlation. The correlation coefficient in the results above is positive, namely 0.424, so the influence of the two variables is unidirectional, which means that if the physical workload is heavier, work fatigue will also increase.

In the rather high category of mental workload, 0 nurses experienced work fatigue in the normal category, 2 nurses (15.4%) experienced work fatigue in the mild category and 11 nurses (84.6%) experienced work fatigue in the moderate category. Meanwhile, in the high category of mental workload as much as 1 nurse (2%) experienced work fatigue in the normal category, as many as 9 nurses (18%) experienced work fatigue in the mild category, and as many as 40 nurses (80%) experienced work fatigue in the category currently.

Pearson correlation test results between mental workload and work fatigue showed a value of p = 0.002 (p <0.05) then Ho was rejected so that there was an influence between mental workload and work fatigue in Inpatient Nurses Dr. Pirngadi Regional General Hospital. Meanwhile, the value of the correlation coefficient (r) is 0.385, which means the level of strength of the relationship (correlation) between the physical workload variable and work fatigue is 0.385 or a low correlation. The correlation coefficient in the results above is positive, namely 0.385, so that the influence of the two variables is unidirectional, which means that if the mental workload is heavier, work fatigue will also increase.

In the less energy intake category, 0 nurses experienced work fatigue in the normal category, 2 nurses (20%) experienced work fatigue in the mild category, and 8 nurses (80%) experienced work fatigue in the moderate category. Meanwhile, in the appropriate energy intake category, 1 nurse (1.9%) experienced work fatigue in the normal category, 43 nurses (81.1%) experienced work fatigue in the mild category, and 11 nurses (17.5%) experienced work fatigue in the moderate category.

The results of the Pearson correlation test between energy intake and work fatigue showed a value of p = 0.0005 (p <0.05) so Ho was rejected so that there was an influence

between energy intake and work fatigue in Inpatient Nurses Dr. Pirngadi Regional General Hospital. Meanwhile, the value of the correlation coefficient (r) is -0.477, which means that the strength of the relationship (correlation) between energy intake and work fatigue is -0.477 or a moderate correlation. The correlation coefficient in the results above is negative, namely -0.477, so the influence of the two variables is in opposite directions, which means that if energy intake increases, work fatigue will decrease.

Multiple linear regression test, which aims to determine the direction of the relationship between the independent variable and the dependent variable and whether each independent variable is positively or negatively related, can be seen in Table. 2 below:

Table 2. Multiple Linear Regression Test

Variable influence	R *square*	Regression Coefficient (β)
Physical workload against work fatigue	0,412	6,897
Mental workload against work fatigue		2,507
Energy intake against fatigue Work		-9,415

Based on Table 2. The study results show that the regression coefficient value of physical workload (β1) is 6.897 > 0, which is positive. This means that the physical workload variable positively affects work fatigue, meaning that if the physical workload is heavier, work fatigue will increase, and vice versa.

The regression coefficient value of mental workload (β2) is 2.507 > 0, which is positive. This means that the mental workload variable positively affects work fatigue, meaning that if the mental workload is heavier, work fatigue will increase, and vice versa.

The regression coefficient value of energy intake is (β3) -9.415 > 0, which is negative. This means that the energy intake variable hurts work fatigue, meaning that if energy intake increases, work fatigue will decrease, and vice versa.

The magnitude of the R Square value contained in the "Model Summary" output is 0.412 or 41.2%. This shows that 41.2% of the variation in work fatigue can be explained by independent variables: physical workload, mental workload and energy intake. Then the remaining 58.8% is explained by other factors outside this research model.

Table 3. T test

Variable Influence	Koefisien Regresi (β)	thitung	Sig.
Physical workload against work fatigue	6,897	3,208	0,002

Mental workload against work fatigue	2,507	2,825	0,006
Energy intake against fatigue Work	-9,415	-3,207	0,002

In Table 3. The results show that the regression coefficient value of physical workload (β1) = 6.897 > 0, with t_{count} (3.208) > t_{table} (2.0009) and significance (0.002) < α (0.05) This shows that the physical workload variable has a positive and significant effect on work fatigue, meaning that if the physical workload increases, work fatigue will increase significantly, and vice versa.

Regression coefficient value of mental workload (β2) = 2.507 > 0 with t_{count} (2.825) > t_{table} (2.0009) and significance (0.006) <α (0.05). This shows that the mental workload variable has a positive and significant effect on work fatigue, meaning that the higher the mental workload, the work fatigue will increase significantly, and vice versa.

The regression coefficient value of energy intake (β3) is -9.415 > 0 with t_{count} (-3.207) < t_{table} (2.0009) and significance (0.002) <α (0.05) This shows that energy intake has a negative and significant effect on work fatigue, meaning that the higher the energy intake, the work fatigue will decrease significantly, and vice versa.

DISCUSSION

The Effect of Physical Workload on Nurse Work Fatigue in the Inpatient Room of Hospital Dr. Pirngadi Regional General Hospital

The results showed that from the results of the Pearson correlation test regarding the effect of physical workload on work fatigue in nurses obtained a value of p = 0.001 (p <0.05), which means that there is a significant influence between physical workload on work fatigue in Inpatient Room nurses Dr. Pirngadi Regional General Hospital. Meanwhile, the value of the correlation coefficient (r) is 0.424, which means the strength of the relationship (correlation) between the workload variable and work fatigue is 0.424 or a moderate correlation.

According to Suma'mur (2014) physical workload requires muscle, heart, and lung work, so if the physical workload is high, the work of the muscles, heart, and lungs will also be higher, and vice versa. This theory is in line with the research results Rosmiati et al., (2019) shows that physical workload significantly affects work fatigue with a value of p = 0.000 <0.05. The path coefficient value shows a positive sign of 0.657, it can be concluded that the physical workload variable has a positive and significant effect on work fatigue at Faisal Islam Hospital Makassar City. In addition, the results show that physical workload and work fatigue have a unidirectional and strong relationship. As for the research results Mulfiyanti (2020) shows that

nurses who feel high fatigue are 43.1% and nurses with moderate workload are 61.5%. The research results obtained about the effect of workload on work fatigue in nurses has a value of p = 0.001 (p <0.05), meaning that there is a significant effect between physical workload on work fatigue in nurses.

Nurses often experience work fatigue disorder related to physical workload. This is supported by research conducted by Wijanarti et al., (2022). The results of the bivariate analysis showed that the value of p = 0.009 α 0.05 (p <α) so it can be concluded that there is a relationship between physical workload and feelings of work fatigue. In addition, research conducted Handayani et al., (2021) it is known that most workers experience moderate fatigue (72.30%) and excessive physical workload (80%). The bivariate analysis results showed that physical workload was significantly related to work fatigue in nurses (p = 0.034).

This is because excessive physical workload can easily occur to nurses, eventually leading to work fatigue, considering that nurses on duty in Inpatient Rooms have greater responsibility by working 24 hours for 7 days with a work shift system. Based on additional interviews with nurses in this study, it was stated that physical workload causes an increase in work fatigue because nurses often have to lift and move patients who cannot move or need assistance. This task requires physical strength and can cause muscle fatigue and stress on the nurse's musculoskeletal system. Other physical workload problems are also faced by nurses who feel that the number of nurses available is not proportional to the amount of work that must be completed. There are many main tasks of nurses and additional tasks performed by nurses during work shifts which result in fatigue for nurses.

The role and authority of nurses in carrying out their duties are based on Law Number 38 of 2014 concerning Nursing, where the main tasks of nurses are to carry out holistic nursing assessments, establish nursing diagnoses, plan nursing actions, carry out nursing actions, evaluate the results of nursing actions, make referrals, provide action in emergencies according to competence, providing nursing consultations and collaborating with doctors, conducting health education and counselling.

This theory is in line with the research results Rosmiati et al., (2019) show that physical workload significantly affects work fatigue with a value of p = 0.000 <0.05. The path coefficient value shows a positive sign of 0.657, so it can be concluded that the physical workload variable positively and significantly affects work fatigue at Faisal Islam Hospital Makassar city. The results of research conducted by Mulfiyanti (2020) show that nurses who feel high fatigue are 43.1%, and nurses with moderate workloads are 61.5%. The research results obtained about the effect of workload on work fatigue in nurses has a value of p = 0.001

(p <0.05), meaning that there is a significant effect between physical workload on work fatigue in nurses.

The Effect of Mental Workload on Nurse Work Fatigue in the Inpatient Room of Hospital Dr. Pirngadi Regional General Hospital

The results showed that the results of the Pearson correlation test regarding the effect of mental workload on work fatigue in nurses obtained a value of p = 0.002 (p <0.05), which means that there is a significant effect between mental workload and work fatigue in nurses in the Inpatient Room. general hospital area Dr. Pirngadi Medan. Meanwhile, the value of the correlation coefficient (r) is 0.385, which means the strength of the relationship (correlation) between the variables of workload and work fatigue is 0.385 or a low correlation.

Among the psychological problems that affect fatigue are mental workload and those borne by nurses. Tarwaka (2019) revealed that mental workload is more dominant, causing workers to feel burdened and fatigued. This fatigue phenomenon can significantly affect work in the health care sector, such as nurses because it can affect patient safety, patient satisfaction and job satisfaction because they interact with patients and their families. Doctors and colleagues.

In this study, the indicators for mental demand, physical demand, own performance, and effort levels received the highest scores. Based on additional interviews with nurses, this is related to the duties of a nurse who has high pressure because at work, nurses have direct contact with various types of patients with different diagnoses and responses. Not only interacting with patients but also patient families, doctors and co-workers. In this study, sources of fatigue were found to be related to the mental workload on nurses, including the level of complexity of patients if nurses had to treat patients with many different health conditions, high time pressure to complete tasks quickly and accurately, and lack of staff. Nurses' conflicts with co-workers or doctors, lack of nurses experience, and heads of rooms always monitor the workspace so that nurses are not free to work.

Another mental workload problem is that nurses often have to deal with situations that require quick and precise decision-making. They must evaluate medical information, prioritize actions, and manage risks. In addition, nurses also have to master extensive medical knowledge and carry out complex tasks, such as interpreting test results, monitoring patient conditions, and managing treatment. The high mental workload associated with these tasks can drain a nurse's mental energy and increase the risk of burnout.

According to Tarwaka (2015) One theory that can explain the effect of mental workload on nurse fatigue is the cognitive theory, where a high mental workload can drain a person's

cognitive (mind) resources, causing mental fatigue. When nurses are in situations requiring high concentration and quick decision-making, their cognitive resources will be drained more quickly. This can cause nurses to feel tired and difficult to maintain optimal performance for a long time (Dimkatni et al., 2020).

This theory is in line with the research Prasetya et al., (2021) state that there is an effect of mental workload on fatigue, Tstatistic = 3.238 > 1.984, and p-value = 0.001 means H0 is rejected, meaning there is a positive and significant effect. In addition, based on the analysis conducted by Wiyarso (2018) it was found that there was an influence between mental workload and the level of work fatigue (p = 0.041) for nurses in the Inpatient Room of Islamic Hospital Siti Khadijah Palembang.

The Effect of Energy Intake on Nurse Work Fatigue in the Inpatient Room of Hosipital Dr. Pirngadi Regional General Hospital

The results showed that the results of the Pearson correlation test regarding the effect of energy intake on work fatigue in nurses obtained a value of p = 0.0005 (p <0.05), which means that there is a significant influence between energy intake on work fatigue in nurses in the inpatient room general hospital area Dr. Pirngadi Medan. Meanwhile, the value of the correlation coefficient (r) is -0.477, which means that the strength of the relationship (correlation) between workload variables and work fatigue is -0.477 or a moderate correlation, which means that if energy intake increases, work fatigue will decrease.

In this study the results were obtained from 63 nurses 10 nurses were experiencing a lack of energy intake, a lack of energy intake can hurt nurse fatigue. This is because insufficient or insufficient energy intake can reduce general body strength and weaken the immune system. As a result, nurses become more easily tired and susceptible to various diseases. In addition, a lack of energy intake can also affect nurses' concentration and focus, so they become tired more quickly and find it difficult to maintain the level of alertness required in carrying out patient care tasks.

On the other hand, of the 63 nurses, 53 nurses had sufficient or appropriate energy intake. Consumption of sufficient energy intake can increase nurses' stamina and physical strength. Adequate nutrition can also help maintain cognitive function and concentration so that nurses can maintain an optimal level of alertness and work performance. In addition, consuming balanced nutrition can help reduce the risk of fatigue and fatigue. Therefore, nurses need to pay attention to their energy intake and ensure that they are getting adequate nutrition to maintain their health and performance. This can be done by eating healthy and nutritious foods like vegetables, fruits, proteins and complex carbohydrates. In addition, nurses must pay

attention to meal times and ensure sufficient energy intake to meet their body's needs in a day's work.

According to Suma'mur (2014) One well-known theory of energy intake is the basal caloric needs theory, which states that the human body needs basal calories or the number of calories needed by the body to maintain basic functions such as heart rate, respiration and blood circulation. Basal caloric needs are affected by a person's age, gender, height, weight, and level of physical activity. If calorie intake is less than the basal calorie requirement, the body will experience a lack of energy which can cause fatigue, weakness, and the risk of illness. Therefore, nurses must pay attention to their basal caloric needs and ensure adequate energy intake to maintain body health and fitness and reduce the risk of work fatigue.

This is in line with research by Sabaruddin et al., (2020) stated that based on statistical tests with chi-square, a P-value of 0.049 > 0.05 was obtained, so it could be concluded that there was a significant difference between energy intake and work fatigue. OR value of 3.938, CI (0.911-17.014). This means that the tendency of nurses with energy intake that does not match the number of nutritional needs has a 3.938 times chance of experiencing high work fatigue. At least nurses with energy intake that do not match the nutritional needs have a risk of 0.911 - 17.014 times more likely to experience high work fatigue than nurses with energy intake that matches the nutritional needs.

Research Daswin et al., (2021) state that there is a significant relationship between energy intake and work fatigue at Awal Bros Hospital, Pekanbaru City (p-value = 0.005). Good energy intake 7 times more likely to feel not tired than respondents with less energy intake. Workers with good nutritional status will have better work capacity and endurance than workers with less and more nutritional status. Workers need nutritious food to maintain the body, repair cells and tissues, grow to a certain age, and carry out activities, including work. Malnutrition has a negative impact because people who suffer from malnutrition, especially calories, will affect their ability to work, and the time to complete their work is even longer, so productivity decreases (Jannah et al., 2022; Diana et al., 2017).

CONCLUSIONS

Based on research that has been done on the effect of physical workload, mental workload and energy intake on work fatigue of nurses in Inpatient Rooms Dr. Pirngadi Regional General Hospital then it can be concluded that there is a positive effect between physical workload, mental workload. There is a negative effect between energy intake on work fatigue in nurses in the Inpatient Room Dr. Pirngadi Regional General Hospital. As much as 41.2% of the causes

of work fatigue can be explained through the variables of physical workload, mental workload and energy intake.

It is necessary to adjust the number of nurses according to the average number of patients so that the workload is by the mental and physical capacities of nurses. It can reduce work fatigue for nurses when the patient's condition is high or normal. Nurses are advised to always pay attention to their daily food consumption to match their daily energy needs, not only the quantity but also the levels of nutrients in the food. Furthermore, nurses should be able to manage time well between work responsibilities and responsibilities outside of work and are expected to be able to take advantage of the rest time they have outside of work.

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